$ AF 3644 Appeal Brief Bates 6/20

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
WILLIAM V. HARDING

Serial No.: 09/847,224

Filed: May 2, 2001

For: AUTONOMOUS MISSION PROFILE PLANNING

Group Art Unit: 3644

Examiner: JOHN W. ELDRED

Atty. Dkt. No.: 2063.002300/JAP

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Assistant Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant hereby submits an original and two copies of this Appeal Brief to the Board of Patent Appeals and Interferences in response to the final Office Action dated January 29, 2003. The fee for filing this Appeal Brief is $320, and is attached hereto.

A Notice of Appeal for this case along with a request for a one-month extension of time to respond and the fees required therefore have been filed this day.

If the check is inadvertently omitted, or should any additional fees under 37 C.F.R. §§ 1.16 to 1.21 be required for any reason relating to the enclosed material, or should an overpayment be included herein, the Assistant Commissioner is authorized to deduct or credit

said fees from or to Williams, Morgan & Amerson, P.C. Deposit Account No. 50-0786/2063.002300/JAP.

I. REAL PARTY IN INTEREST

The real party in interest is Lockheed Martin Corporation.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences of which Applicant, Applicant's legal representative, or the Assignee is aware that will directly affect or be directly affected by or have a bearing on the decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 1-75 are pending in the case and are involved in the present appeal. The Office Action rejected each of claims 1-75. More particularly, the Office Action rejected:

- claims 1-75 as "vague and indefinite" under 35 U.S.C. § 112, ¶2, for several different reasons; and
- claims 1-75 as anticipated under 35 U.S.C. § 102 (b), by U.S. Letters Patent 6,043,867 ("Saban") or U.S. Letters Patent 5,631,653 ("Reedy").

Applicant appeals herein each of the rejections.

IV. STATUS OF AMENDMENTS

There were no amendments submitted after the "final" Office Action.

V. SUMMARY OF THE INVENTION

Many current weapons and reconnaissance system designs consider the ability to be deployed from a remote location and the ability to adapt to rapidly changing battlefield conditions. Unfortunately, these two considerations are often at odds, for if the system is deployed at a great distance, the battlefield conditions may have change considerably during the mission. For instance, a mobile target, such as a tank or a SCUD missile launcher, may move a relatively great distance between the time a system is deployed and the time it arrives at the presumed location of the target.

The invention includes a method and apparatus for planning a mission profile in real time on board a platform or a vehicle dispensed from a platform. The method may be used to promulgate an original mission profile or an updated mission profile, or both, depending on the implementation. In general, the method includes:

- ascertaining a plurality of target information including a target location, a target velocity, and a target location error; and
- autonomously determining a pattern from the ascertained information.

The term "autonomous," as used herein, means under programmed control without human intervention.

Referring now to **FIG. 6** (reproduced below), in one particular implementation, the autonomous determination includes projecting along a target axis 610 a direction opposite a target heading 210 defined by the target velocity a distance of at least twice the target location error to establish an intersection 615 of the target axis 610 with the target location error 420. The method then projects left and right relative to the target axis 610 from the intersection 615 a distance at least as great as one-half the target location error 420 to determine a pair of possible start points 620, 625. The method then selects the possible start point 620, 625 closest to the platform 130. From the selected start point 620, a dispense point 230 is determined. The method then lays out a trace, such as the trace 430 shown in **FIG. 4B**, from the selected start point 620. The trace is translated along a heading 210 defined by the target velocity a distance determined by the elapsed time of travel for the platform 130 to the dispense point 230 and for a vehicle, such as the vehicle 120 in **FIG. 4A**, from the dispense point 230 to the start point 620.

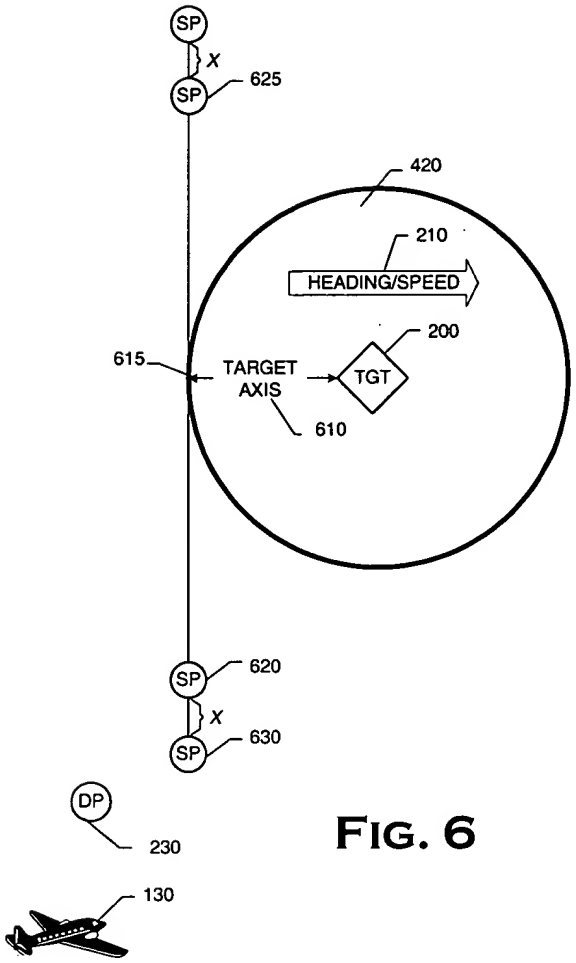


FIG. 6

As was previously mentioned, the pattern (*e.g.*, the trace 430 in **FIG. 4B**) is determined "autonomously," *i.e.*, under programmed control without human intervention Thus, in other aspects, the invention includes a computing device programmed to perform this autonomous determination or a program storage device encoded with instructions for performing such a determination. Computing devices and program storage devices are illustrated in **FIG. 8A – FIG. 8D** and in **FIG. 9**.

VI. ISSUES ON APPEAL

A. Whether the phrase "determining a pattern" in claims 1, 18, 34, 50, 65, and 75 is vague and indefinite under 35 U.S.C. § 112, ¶ 2 in light of the specification and the knowledge of those skilled in the art.

B. Whether the phrase "assuming a value" in claims 2, 19, and 51 is vague and indefinite under 35 U.S.C. § 112, ¶ 2.

C. Whether claims 6, 23, 59, 67, and 69 are vague and indefinite under 35 U.S.C. § 112, ¶ 2 because they claim in the alternative.

D. Whether claims 1-75 are anticipated under 35 U.S.C. § 102 (b) by either one of U.S. Letters Patent 6,043,867 ("Saban") and U.S. Letters Patent 5,631,653 ("Reedy").

VII. GROUPING OF THE CLAIMS

The claims do not all rise and fall together. Although all claims are rejected as anticipated on the same references, not all are rejected as vague and indefinite. Furthermore, among those rejected as vague and indefinite, there are two different grounds. Applicant groups the claims as follows:

- claims 1, 18, 34, 50, 65, and 75, rejected as vague and indefinite for recitation of the phrase "determining a pattern" and as anticipated by Saban and Reedy;
- claims 2, 19, and 51 rejected as vague and indefinite for recitation of the phrase "assuming a value" and as anticipated by Saban and Reedy;
- claims 6, 23, 59, 67, and 69 rejected as vague and indefinite for claiming in the alternative and as anticipated by Saban and Reedy; and
- claims 3-5, 7-17, 20-22, 24-33, 35-49, 52-64, 66, 68, and 70-74 rejected as anticipated by Saban and Reedy.

Applicant notes, however, that the argument is not organized around these claim groupings, but rather around the substantive issues presented by the rejections.

VIII. ARGUMENT

As noted above, the Office Action rejected the claims on two separate grounds. First, claims 1-75 were rejected as "vague and indefinite" under 35 U.S.C. § 112, ¶2, for several different several different reasons varying by claim. Second, the Office Action rejected claims 1-75 as anticipated under 35 U.S.C. § 102 (b), by U.S. Letters Patent 6,043,867 ("Saban") or

U.S. Letters Patent 5,631,653 ("Reedy"). Applicant traverses the rejections and addresses each statutory ground of rejection in turn.

A. The Phrase "Determining a Pattern" in Claims 1, 18, 34, 50, 65, and 75 is Definite in Light of the Specification and the Knowledge of Those Skilled in the Art

The final Office Action rejected claims 1, 18, 34, 50, 65, and 75 as indefinite for reciting the limitation "determining a pattern." Admittedly, in the abstract, the term "pattern" has many meanings. For instance, the word "pattern"—alleged to be indefinite here—used as a noun, can be defined as follows:

> **1. a.** An archetype. **b.** An ideal worthy of imitation: *a pattern of womanly virtues*. **2.** A plan, diagram, or model to be followed in making things: *dress patterns*. **3.** A representative sample; specimen. **4. a.** An artistic or decorative design: *a paisley pattern*. **b.** A design of natural or accidental origin: *snowflake patterns*. **5.** A composite of traits or features characteristic of an individual: *behavioral patterns*. **6.** Form and style in an artistic work or body of artistic works. **7. a.** The configuration of identically aimed rifle shots upon a target. **b.** The distribution and spread of shot from a shotgun. **8.** Enough material to make a compete garment. **9.** A standardized diagram transmitted to test television picture quality. **10.** The ordered flight path of an aircraft about to land.

The American Heritage Dictionary, p. 911 (Houghton Mifflin Co. Boston 1982). Thus, presumably, the Office's earlier rhetorical question, "What is forming the pattern and what type of pattern is being formed?"

However, claims are not construed in the abstract. Claims are to be construed as by one of ordinary skill in the art. Claims are also to be construed in light of the specification. As the Office admits:

> The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:
>
> (A) *The content of the particular application disclosure*;
>
> (B) The teachings of the prior art; and

(C) The claim interpretation *that would be given by one possessing the ordinary level of skill in the pertinent art* at the time the invention was made.

M.P.E.P. § 2173.02 (emphasis added). "During patent examination, the pending claims must be given the broadest reasonable interpretation *consistent with the specification.*" M.P.E.P. § 2173.05 (a) (emphasis added).

Applying these principles, the limitation "determining a pattern" takes on striking clarity. One skilled in the art would immediately eliminate most of the spurious definitions of pattern when construing this limitation within the context of the art. For instance, one skilled in the art could immediately eliminate meanings such as "[a] standardized diagram transmitted to test television picture quality" found in the definition quoted above. It is readily apparent in the context of the art and in light of the specification that the "pattern" is a "search pattern." (specification, p. 8, lines 17-20; p. 11, lines 15-23; p. 12, lines 7-12; FIG. 4B and associated text; FIG. 5 and associated text) It is also readily apparent that the "what is forming the pattern" is some kind of computing device. (FIG. 8A – FIG. 8D & FIG. 9 and associated text on pp. 17-18)

Applicant notes that these arguments were presented in the response to the Office Action dated September 12, 2002. However, the final Office Action did not address them. The final Office Action merely reiterated that the phrase "determining a pattern" is indefinite. There was no showing as to why or how a person skilled in the art would be unable to ascertain the scope of the phrase in light of the specification. Thus, Applicant contends that, at a minimum, the Office has failed to *prima facie* establish the indefiniteness of the claims.

B. <u>The Phrase "Assuming a Value" in Claims 2, 19, and 51 is Definite</u>

The final Office Action rejected claims 2, 19, and 51 is vague and indefinite for reciting "assuming a value." The phrase, when construed as by one of ordinary skill in the art and in light of the specification, is definite. The Office's position regarding "ascertaining" and "assuming" flawed much like its position on "determining a pattern." The Office alludes to but one meaning for the term "ascertain." However, it is clear from the specification that Applicant employs a broader meaning. For instance, at p. 10, lines 28-30, the specification states:

> The invention also admits wide variation in the manner in which the target information is ascertained. Some implementation

will simply assume values for one or more of the TLE, target heading, and target speed.

And, at p. 13, lines 3-8:

> Thus, it is desirable to ascertain a true heading 210 instead of assuming one. Note, however, that assuming the heading does not prevent implementation of the present invention, but merely affects the orientation of the pattern relative to the target's heading. Similarly, knowing the target's speed is also desirable, as it permits a smaller TLE 420, but a target speed may be assumed and reflected in a larger magnitude for the TLE 420.

And at p. 17, lines 8-9:

> Other aspects of the invention are similarly subject to variation. Other than the target location, the target information may be ascertained by observation or assumed at some value.

Thus, it is clear from the specification that Applicant is using a meaning for the term "ascertain" broader than the one chosen by the Office. Furthermore, Applicant notes that there is no *evidence* of record that the term "ascertain" is limited to the meaning selected by the Office and excluding that used by Applicant.

C. Claims 6, 23, 59, 67, and 69 are Definite Despite Claiming in the Alternative

Claims 6, 23, 59, 67, and 69 were rejected as indefinite as being claimed in the alternative. However, it is well settled that claiming in the alternative does not render a claim indefinite *per se*. Per the Office, "Applicant may use functional language, *alternative expressions*, negative limitations, *or any style of expression of format of claim which makes clear the boundaries of the subject matter for which protection is sought.*" M.P.E.P. § 2173.01 (emphasis added). More particularly:

> Alternative expressions using "or" are acceptable, such as "wherein R is A, B, C, or D." The following phrases were each held to be acceptable and not in violation of 35 U.S.C. 112, second paragraph in *In re Gaubert*, 524 F.2d 1222, 187 USPQ 664 (CCPA 1975): "made entirely or in part of"' "at least one piece" and "iron, steel or any other magnetic material."

M.P.E.P. § 2173.05 (i), p. 2100-202. The Office provides no reason why the alternative claiming formats in the cited claims are vague. Thus, the rejection constitutes a rejection of alternative

claiming formats *per se*, in contravention of Office policy evidenced in the M.P.E.P. passages cited above.

Applicant therefore requests these rejections be overturned. Applicant notes that these arguments were presented in the response to the Office Action dated September 12, 2002. However, the final Office Action did not address them. The final Office Action merely reiterated that the claims are indefinite for claiming in the alternative. There was no showing as to why or how a person skilled in the art would be unable to ascertain the scope of these claims in light of the alternative claiming format. Applicant therefore maintains his position that the rejections constitute a *per se* rejection in violation of Office policy.

D. Claims 1-75 are Novel Over Saban and Reedy

The Office Action rejected claims 1-75 as anticipated under 35 U.S.C. § 102 (b), by U.S. Letters Patent 6,043,867 ("Saban") or U.S. Letters Patent 5,631,653 ("Reedy"). Applicant traverses this rejection on two grounds. First, the Office failed to establish *prima facie* that the claims are anticipated. Second, Saban and Reedy fail disclosed each limitation of the independent claims in the relationship in which they are claimed.

1. The Office Failed In Its *Prima Facie* Proof

"It is by now well settled that the burden of establishing a *prima facie* case of anticipation resides with the Patent and Trademark Office. *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984) quoting *In re Warner*, 379 F.2d 1011, 1016, 154 U.S.P.Q. 173, 177 (C.C.P.A. 1967); *Ex parte Skinner*, 2 U.S.P.Q.2d (BNA) 1788, 1788-89 (Bd. Pat. App. & Int. 1987). An anticipating reference, by definition, must disclose every limitation of the rejected claim in the same relationship to one another as set forth in the claim. *In re Bond*, 15 U.S.P.Q.2d (BNA) 1566, 1567 (Fed. Cir. 1990). "[I]t is incumbent upon the [Office] to identify wherein each and every facet of the claimed invention is disclosed in the applied reference." *Ex parte Levy*, 17 U.S.P.Q.2d (BNA) 1461, 1462 (Pat. & Tm. Off. Bd. Pat. App. & Int. 1990).

It is this last requirement that the Office fails to meet in the present case. The entire statement of the rejection in the Office Action dated September 12, 2002 was:

> Claims 1-75 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Saban or Reedy.
>
> See especially column 12, lines 10-45 of Saban and column 4, line 40 – column 8, line 60 [of Reedy].

Applicant raised this deficiency in the *prima facie* case in the response to that Office Action. In response, the final Office Action merely stated "[s]ee especially column 12, lines 10-45 and column 4, line 40 – column 8, line 60." As is set forth below, Applicant is unable to find a teaching of the limitation "autonomously determining a pattern." Applicant specifically requested clarification on where the references teach this limitation, but no such clarification was forthcoming.

Thus, the Office summarily points to selected portions of the references without ever pointing out where even a single limitation of a single claim is disclosed within those portions. How can Applicant be expected to evaluate the reasonableness and/or correctness of the construction of the references if the construction is not even put forth? Applicant respectfully submits that the Office failed to meet the standard of *Levy*.

2. Saban and Reedy Fail to Disclose Every Limitation of the Claims

As noted above, an anticipating reference, by definition, must disclose every limitation of the rejected claim in the same relationship to one another as set forth in the claim. *In re Bond*, 15 U.S.P.Q.2d (BNA) 1566, 1567 (Fed. Cir. 1990). Applicant respectfully submits that both Saban and Reedy fail to meet this standard and, therefore, do not anticipate any of claims. Each of the independent claims recites a limitation approximating "autonomously determining a pattern." (cl. 1, line 4; cl. 18, line 4; cl. 34, line 7; cl. 50, line 7; cl. 65, lines 8-9; cl. 75, line 5). The Office has failed to identify any teaching of this limitation in either Saban or Reedy. Applicant's review has not found any and the Office has not clarified where or how Saban or Reedy teaches this limitation, despite an express request that it do so. Thus, Applicant respectfully submits that claims 1-75 are novel over Saban and Reedy since they do not teach the cited limitation or, at a minimum, the Office has failed to establish that it does.

IX. CLAIMS IN ISSUE

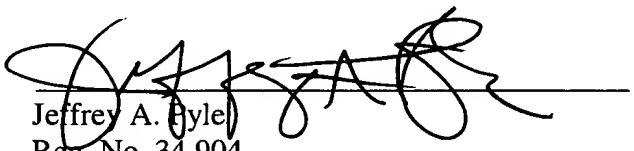
The claims in issue are set forth in the Appendix hereto.

X. CONCLUSION

Applicant therefore respectfully submits that all rejections should be overturned. Claims 1, 2, 18, 19, 34, 50, 51, 65, and 75 as indefinite when construed in light of the specification. The rejections of claims 6, 23, 59, 67, and 69 as indefinite for claiming in the alternative constitute a *per se* rejection in violation of Office policy. And claims recite 1-75 each recite a limitation approximating "autonomously determining a pattern" that is not taught by any of the cited references. Accordingly, Applicant requests that the rejections be overturned and that the application be allowed to issue.

Please date stamp and return the enclosed postcard to evidence receipt of this document.

Respectfully submitted,



Jeffrey A. Pyle
Reg. No. 34,904

Attorney for Applicant

WILLIAMS, MORGAN & AMERSON
10333 Richmond Dr., Suite 1100
Houston, Texas 77042
(713) 934-7000

Date: May 29, 2003

APPENDIX
(CLAIMS IN ISSUE)

2063.002300/JAP
VS-00543

1. (Original) A method for planning a mission profile in real time, comprising:
ascertaining a plurality of target information, including a target location, a target velocity, and a target location error; and
autonomously determining a pattern from the ascertained target information.

2. (Original) The method of claim 1, wherein ascertaining the target information includes assuming a value for at least one of the target velocity and the target location error.

3. (Original) The method of claim 1, wherein ascertaining the plurality of target information includes ascertaining a target location that places the target in the air, on the surface, or submerged underwater.

4. (Original) The method of claim 1, wherein ascertaining the plurality of target information includes receiving at least one of the target location, target velocity, and target location error in a transmission.

5. (Original) The method of claim 1, further comprising:
dispensing at least a formation including at least one vehicle; and
implementing the pattern with the vehicle.

6. (Original) The method of claim 5, wherein ascertaining the target information includes:
acquiring the target information at a platform from which the formation is dispensed;
receiving at least the target location from a platform other than the platform from which the formation is dispensed; or
acquiring the target information aboard the vehicle.

7. (Original) The method of claim 5, wherein dispensing the formation includes:
launching the formation from an airborne platform; or
launching the formation from a surface-based platform; or

launching the formation from an underwater platform.

8. (Original) The method of claim 5, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

9. (Original) The method of claim 1, wherein autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

10. (Original) The method of claim 1, wherein autonomously determining the pattern from the ascertained target information includes:

projecting along a target axis a direction opposite a target heading defined by the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point.

11. (Original) The method of claim 10, further comprising:

dispensing a formation including at least one vehicle, at the dispense point defined by the preplanned mission profile; and

implementing the pattern with the formation at the selected start point.

12. (Original) The method of claim 11, further comprising adjusting the selected start point by a predetermined distance along a leg of the trace.

13. (Original) The method of claim 10, wherein projecting along the target axis opposite the target heading includes projecting 180° relative to the target heading.

14. (Original) The method of claim 10, wherein projecting left and right includes projecting ±90°.

15. (Original) The method of claim 1, further comprising identifying the target.

16. (Original) The method of claim 15, wherein identifying the target includes employing an automatic target recognition system.

17. (Original) The method of claim 15, further comprising attacking the target.

18. (Original) A method for planning a mission profile in real time, comprising:

ascertaining a plurality of target information, including a target location, a target velocity, and a target location error; and

autonomously determining a pattern including a trace from the ascertained target information, including:

projecting along a target axis a direction opposite a target heading defined by the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point.

19. (Original) The method of claim 18, wherein ascertaining the target information includes assuming a value for at least one of the target velocity and the target location error.

20. (Original) The method of claim 18, wherein ascertaining the plurality of target information includes ascertaining a target location that places the target in the air, on the surface, or submerged underwater.

21. (Original) The method of claim 18, wherein ascertaining the plurality of target information includes receiving at least one of the target location, target velocity, and target location error in a transmission.

22. (Original) The method of claim 18, further comprising:
dispensing at least a formation including at least one vehicle; and
implementing the pattern with the vehicle.

23. (Original) The method of claim 22, wherein ascertaining the target information includes:
acquiring the target information at a platform from which the formation is dispensed;
receiving at least the target location from a platform other than the platform from which the formation is dispensed; or
acquiring the target information aboard the vehicle.

24. (Original) The method of claim 22, wherein dispensing the formation includes:
launching the formation from an airborne platform; or
launching the formation from a surface-based platform; or
launching the formation from an underwater platform.

25. (Original) The method of claim 22, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

26. (Original) The method of claim 18, wherein autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

27. (Original) The method of claim 18, further comprising:

dispensing a formation including at least one vehicle at the dispense point defined by the preplanned mission profile; and

implementing the pattern with the formation at the selected start point.

28. (Original) The method of claim 27, further comprising adjusting the selected start point by a predetermined distance along a leg the trace.

29. (Original) The method of claim 18, wherein projecting along the target axis opposite the target heading includes projecting 180° relative to the target heading.

30. (Original) The method of claim 18, wherein projecting left and right includes projecting ±90°.

31. (Original) The method of claim 18, further comprising identifying the target.

32. (Original) The method of claim 31, wherein identifying the target includes employing an automatic target recognition system.

33. (Original) The method of claim 31, further comprising attacking the target.

34. (Original) An apparatus for use in planning a mission profile in real time, comprising:

a receiver capable of receiving a plurality of target information, the target information including a target location;

a computing device; and

a program storage device encoded with instructions that, when executed by the computing device, perform a method for autonomously determining a pattern from the target information.

35. (Original) The apparatus of claim 34, wherein the method for autonomously determining the pattern from the target information includes assuming a value for at least one of a target velocity and a target location error.

36. (Original) The apparatus of claim 34, wherein the receiver, the computing device, and the program storage device are distributed across a platform and a vehicle.

37. (Original) The apparatus of claim 36, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

38. (Original) The apparatus of claim 36, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

39. (Original) The apparatus of claim 34, wherein the receiver, the computing device, and the program storage device comprise a portion of a platform.

40. (Original) The apparatus of claim 39, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

41. (Original) The apparatus of claim 34, wherein the receiver, the computing device, and the program storage device comprise a portion of a vehicle.

42. (Original) The apparatus of claim 41, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

43. (Original) The apparatus of claim 34, wherein the encoded method for autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

44. (Original) The apparatus of claim 34, wherein the encoded method for autonomously determining the pattern includes:

projecting along a target axis 180° off the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point.

45. (Original) The apparatus of claim 44, wherein the encoded method for autonomously determining the pattern further comprises adjusting the selected start point by a predetermined distance along a leg of the trace.

46. (Original) The apparatus of claim 44, wherein the projecting along the target axis opposite the target heading in the encoded method includes projecting 180° relative to the target heading.

47. (Original) The apparatus of claim 44, wherein projecting left and right in the encoded method includes projecting ±90°.

48. (Original) The apparatus of claim 34, further comprising an automatic target recognition system.

49. (Original) The apparatus of claim 48, wherein the method for autonomously determining the pattern further comprises identifying the target.

50. (Original) An apparatus for planning a mission profile in real time, comprising:

a receiver capable of receiving a plurality of target information, the target information including a target location;

a computing device; and

a program storage device encoded with instructions that, when executed by the computing device, perform a method for autonomously determining a pattern from the ascertained target information, the method including:

projecting along a target axis a direction opposite a target heading defined by the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point.

51. (Original) The apparatus of claim 50, wherein the method for autonomously determining the pattern from the target information includes assuming a value for at least one of a target velocity and a target location error.

52. (Original) The apparatus of claim 50, wherein the receiver, the computing device, and the program storage device are distributed across a platform and a vehicle.

53. (Original) The apparatus of claim 52, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

54. (Original) The apparatus of claim 52, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

55. (Original) The apparatus of claim 50, wherein the receiver, the computing device, and the program storage device comprise a portion of a platform.

56. (Original) The apparatus of claim 55, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

57. (Original) The apparatus of claim 50, wherein the receiver, the computing device, and the program storage device comprise a portion of a vehicle.

58. (Original) The apparatus of claim 57, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

59. (Original) The apparatus of claim 50, wherein the method for autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

60. (Original) The apparatus of claim 50, wherein the method for autonomously determining the pattern further comprises adjusting the selected start point by a predetermined distance along a leg of the trace.

61. (Original) The apparatus of claim 50, wherein projecting along the target axis opposite the target heading in the encoded method includes projecting 180° relative to the target heading.

62. (Original) The apparatus of claim 50, wherein projecting left and right in the encoded method includes projecting ±90°.

63. (Original) The apparatus of claim 50, further comprising an automatic target recognition system.

64. (Original) The apparatus of claim 63, wherein the method for autonomously determining the pattern further comprises identifying the target.

65. (Original) An apparatus capable of planning a mission profile in real time, comprising:
a platform, including

a receiver capable of receiving a plurality of target information, the target information including a target location;

a first computing device; and

a first program storage device encoded with instructions that, when executed by the computing device, perform a method for autonomously determining a pattern from the ascertained target information, the method including:

projecting along a target axis a direction opposite a target heading defined by the target velocity a distance of at least twice the target location error to establish an intersection of the target axis with the target location error;

projecting left and right relative to the target axis from the intersection a distance at least as great as one-half the target location error to determine a pair of possible start points;

selecting the possible start point closest to the platform;

determining a dispense point;

laying out a trace from the selected start point; and

translating the trace along a heading defined by the target velocity a distance determined by the elapsed time of travel for the platform to the dispense point and for a vehicle from the dispense point to the start point; and

a vehicle, including:

a second program storage device capable of being encoded with the pattern by the first computing device; and

a second computing device capable of implementing the pattern encoded on the second program storage device through control of the vehicle.

66. (Original) The apparatus of claim 65, wherein the method for autonomously determining the pattern from the target information includes assuming a value for at least one of a target velocity and a target location error.

67. (Original) The apparatus of claim 65, wherein the platform is an airborne platform, a surface platform, or a submerged platform.

68. (Original) The apparatus of claim 65, wherein the vehicle includes a vehicle selected from the group consisting of a submersible vehicle, a reconnaissance drone, a flying submunition, a cruise missile, and a smart bomb.

69. (Original) The apparatus of claim 65, wherein the method for autonomously determining the pattern from the ascertained target information includes autonomously determining a serpentine pattern or a fan blade pattern.

70. (Original) The apparatus of claim 65, wherein the method for autonomously determining the pattern further comprises adjusting the selected start point by a predetermined distance along a leg of the trace.

71. (Original) The apparatus of claim 65, wherein projecting along the target axis opposite the target heading in the encoded method includes projecting 180° relative to the target heading.

72. (Original) The apparatus of claim 65, wherein projecting left and right in the encoded method includes projecting ±90°.

73. (Original) The apparatus of claim 65, further comprising an automatic target recognition system.

74. (Original) The apparatus of claim 73, wherein the method for autonomously determining the pattern further comprises identifying the target.

75. (Original) An apparatus for planning a mission profile in real time, comprising:

means for ascertaining a plurality of target information, including a target location, a target velocity, and a target location error; and

means for autonomously determining a pattern from the ascertained target information.